

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Piezophototronic Effect Enhanced Self-powered UV/Visible Photodetector Based on Type-II ZnO/ZnSe Core/Shell Heterojunction**  
SHUKE YAN, SATISH RAI, ZHI ZHENG, FAHAD ALQARNI, MANISH BHATT, MICHAEL RETANA, WEILIE ZHOU, Univ of New Orleans — Piezophototronic effect, coupling of piezoelectric and optical properties in semiconductor materials, has attracted much interest recently because of its capabilities of improving device performance significantly. In this paper, we report a Piezophototronic effect enhanced self-powered broadband UV/visible photodetector based on ZnO/ZnSe core/shell nanowire array. The integrated photodetector based on the ZnO/ZnSe core/shell structure is capable of detecting the whole band range of the visible spectrum as well as UV light, and it is further boosted through applying compressive load under different wavelength excitation sources by three orders of magnitude in the relative responsivity. The significant improved performance is believed to stem from piezophototronic effect and its abrupt interface between ZnSe and ZnO. Furthermore, the device exhibits good self-powered photodetection performance under UV/visible light illumination. This work is expected to generate broad interest in exploring the application using type II heterostructure for broadband UV/visible photodetection under both powered and self-powered conditions.

Shuke Yan  
Univ of New Orleans

Date submitted: 09 Nov 2016

Electronic form version 1.4